

is more interesting. The scale of the four pictures is exactly the same, and shows the increase of size and of the movement of the comet. Indeed, on a picture of October 8 the tail covers the whole plate and is longer than $3\frac{1}{2}$ degrees.

Now the stereoscope allows us to decide upon an interesting problem which occurred to me in photographing comets.

Examining the star trails on a photograph of a comet I found that every trail of a faint fixed star entering the tail of the comet, instead of becoming fainter by absorption, increases sensibly in brightness. It is a very striking appearance, and I sought for an explanation. I thought that it was produced by the increase of rapidity of the photographic film caused by the faint light of the tail, the so-called "Vorbelichtung." Now the stereo seems to show that this is wrong, and that the phenomenon is an optical effect. Viewing one print in the stereoscope with one eye—closing the other—we see the striking brightening of the star trails in the tail; opening the second eye we see this effect disappear, and the light of the dust of the comet's tail become immediately separated from the light of the fixed star, so that the star trail retains nearly exactly its own brightness while travelling behind the tail of the comet.

In making reproductions of original plates of comets I always found the sky very much brighter on the side of the tail, even many degrees from the comet's nucleus and over a very large area, so that there is no doubt that the cometic matter fills all space around.

*Heidelberg, Königstuhl Astrophys. Observatory:
1902 October 22.*

[The stereoscopic pictures are placed in the Library.]

Note on a Comparison of Groombridge's Catalogue (1810) with the Greenwich Second Ten-Year Catalogue (1890), with reference to the Question of an Apparent Rotation of the Brighter Fixed Stars as a Whole with respect to the Fainter Stars.

(Communicated by the Astronomer Royal.)

In a preliminary note in *Astronomische Nachrichten*, No. 3800, Sir David Gill concludes, as the result of a comparison of Taylor's Madras Catalogue with modern Cape Catalogues, that the brighter stars rotate with respect to the fainter stars as a whole. As in the preparation of the Greenwich Second Ten-Year Catalogue for 1890 Groombridge's Catalogue for 1810 had been brought up to 1890 for comparison, means were to hand to see whether Dr. Gill's conclusions were supported by a comparison of observations made with an interval of eighty years in the part of

the sky from 35° to 50° N.P.D. Nearer the pole the number of stars is too few to make a comparison of much value.

In the following comparison, stars were excluded for which a proper motion is given in the Greenwich Ten-Year Catalogue for 1890. This was done merely as a matter of convenience in diminishing numerical work, as, in view of the re-reduction of Groombridge's observations now in progress, this comparison is only to be regarded as a provisional one. This method of selection leaves out stars of large proper motion, and also all the stars observed by Bradley for which the proper motions obtained by Auwers were adopted in the Ten-Year Catalogue, but as regards cosmical distribution of the stars is quite fortuitous. When the re-reduction of Groombridge's observations is finished a more complete and detailed comparison will be made, but it is of interest to place the present comparison on record in view of Sir David Gill's paper.

Excess of Right Ascension of the Greenwich Second Ten-Year Catalogue (1890) over Groombridge's Catalogue (1810) for the Stars between 35° and 50° N.P.D.

| Limits of R.A. | Mag. 5°-5°9. | | Mag. 6°-6°9. | | Mag. 7°-7°9. | | Mag. 8°-8°9. | |
|-------------------|--------------|------------------|--------------|------------------|--------------|------------------|--------------|-----------------|
| | Diff. | No. of Stars. | Diff. | No. of Stars. | Diff. | No. of Stars. | Diff. | No. of Stars |
| 0- 3 | +.29 | 16 | +.06 | 50 | +.09 | 136 | +.03 | 89 |
| 3- 6 | +.22 | 16 | +.13 | 41 | +.11 | 94 | +.01 | 67 |
| 6- 9 | +.23 | 8 | -.06 | 43 | -.06 | 72 | -.12 | 38 |
| 9-12 | .00 | 11 | +.04 | 27 | -.14 | 77 | -.04 | 28 |
| 12-15 | -.09 | 8 | -.03 | 22 | -.03 | 39 | -.13 | 23 |
| 15-18 | -.06 | 9 | +.03 | 43 | -.01 | 69 | +.05 | 14 |
| 18-21 | +.22 | 18 | +.13 | 104 | +.12 | 225 | +.05 | 181 |
| 21- 0 | +.18 | 18 | +.15 | 75 | +.18 | 169 | +.07 | 131 |
| Mean ... | +.12 | 104 | +.06 | 405 | +.03 | 881 | -.01 | 571 |

It is to be noted that no magnitude-corrections have been applied in forming these results, and although the progressive diminution of the means agrees in sign with the results given by Sir David Gill, it hardly affords sufficient evidence, in view of the unknown magnitude-correction, on which to base any conclusion as to a cosmical movement of the nature indicated by Sir D. Gill.

It will be of interest to see how far these results will be affected by the re-reduction of Groombridge's observations now nearly completed.

Newcomb's Fundamental Catalogue: Notes and Errata.
By W. G. Thackeray.

Notes.

The places and proper motions of the two following stars, the first in R.A. and Dec., the second in R.A. only, do not appear to be correct, apparently owing to the Piazzi places being discordant.

The following data, reduced to 1900 with Struve's precession and no proper motion, have not been corrected for systematic differences of the catalogues.

The Groombridge Catalogue places are from the new reductions.

No. 1464.

| Catalogue. | R.A. 1900. h. m. s. | Epoch. | No. of Obs. | Dec. 1900. | | | Epoch. | No. of Obs. |
|------------------------|------------------------|----------------|----------------|------------|------|-----|---------------|----------------|
| | | | | ° | ' | " | | |
| Piazzi xxii., 36 | 22 9 34.44 | 1800 | 10 | 38 | 43 | 9.5 | 1800 | 7 |
| Groombridge, 3716 | 34.88 | 1809.9 | 6 | | 6.54 | | 1809.9 | 6 |
| Radcliffe, 5612 | 34.97 | 1849.7 | 2 | | 7.30 | | 1849.8 | 2 |
| Greenwich (1860), 1859 | 34.99 | 1859.7 | 4 | | 6.79 | | 1859.8 | 6 |
| Brussels, 6189 | 34.95 | 1869.1 | 3 | | 7.13 | | 1869.1 | 3 |
| Greenwich (1872), 2085 | 34.98 | 1872.2 | 5 | | 6.76 | | 1872.2 | 10 |
| „ (1880), 3718 | 35.03 | 1881.1 | 3 | | 7.05 | | 1881.4 | 5 |
| „ (1890), 6189 | 35.12 | 1892.3 | 5 | | 7.28 | | 1891.1 | 10 |
| Newcomb, 1464 | 35.489 | 1900.0 | | | 6.55 | | 1900.0 | |
| | | P.M. + 0°.0126 | | | | | P.M. + 0°.021 | |

No. 1556.

| Catalogue. | R.A. 1900.0. h. m. s. | Epoch. | No. of Obs. | | | |
|------------------------|--------------------------|----------------|------------------|--|--|--|
| | | | | | | |
| Piazzi xxiii., 101 | 23 25 23.63 | 1800 | 19 | | | |
| Groombridge, 4078 | 24.50 | 1809.8 | 12 | | | |
| Radcliffe, 6092 | 24.45 | 1845.1 | 5 | | | |
| Brussels, 10536 | 24.60 | 1868.1 | 4 | | | |
| Helsingfors, 14105 | 24.55 | 1871.8 | 2 | | | |
| Greenwich (1890), 6681 | 24.68 | 1893.3 | 10 $\frac{1}{2}$ | | | |
| Newcomb, 1556 | 24.960 | 1900.0 | | | | |
| | | P.M. + 0°.0072 | | | | |

Errata.

Newcomb No.

60. Secular variation in Dec. 1900 for $-44''$.18 read $-54''$.18. No. in Bradley Insert 65.

1589. Seconds of R.A. 1875 and 1900 appear to be 1^s too great.